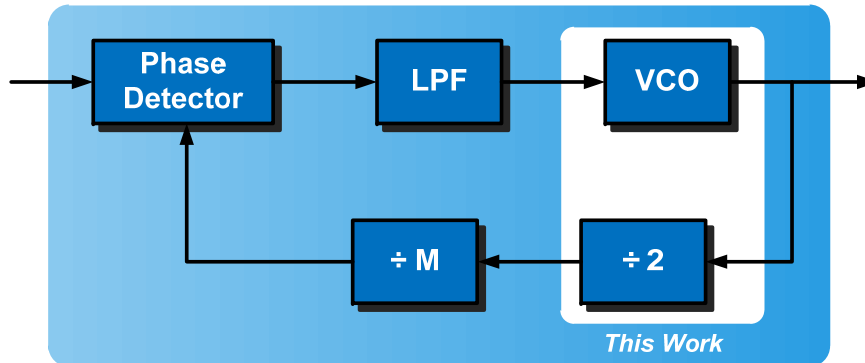
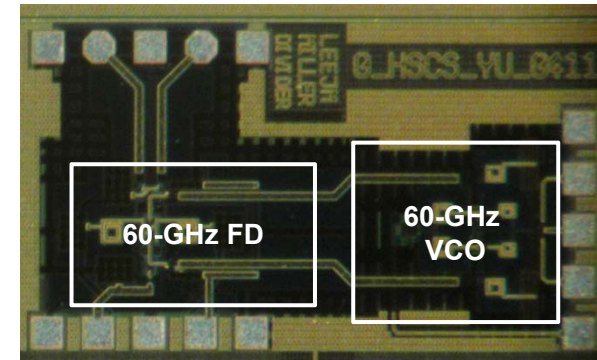


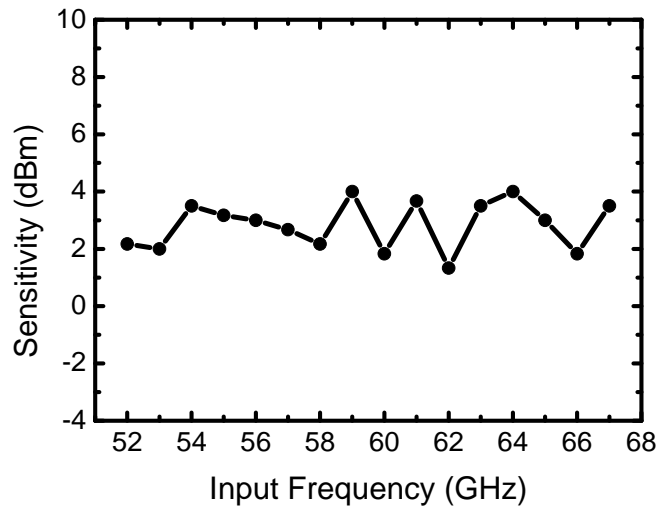
60-GHz VCO + Frequency Divider (FD)



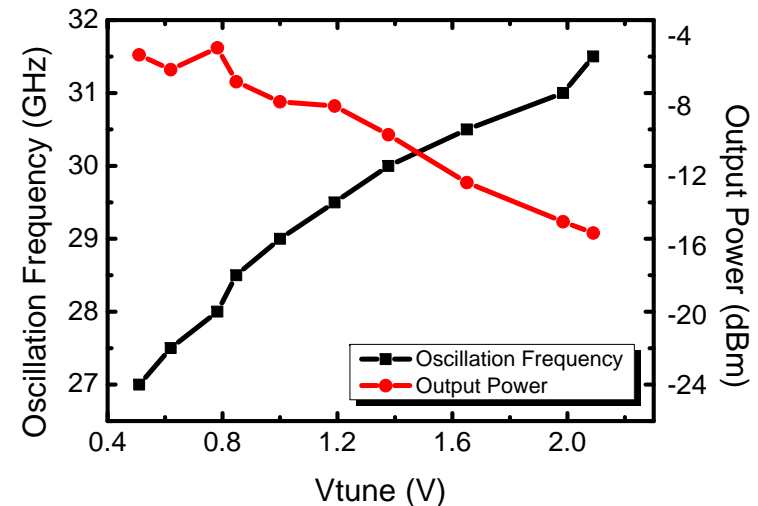
<Basic phase-locked loop (PLL)>



<Chip photo of integrated VCO and FD>



<Input sensitivity of FD>

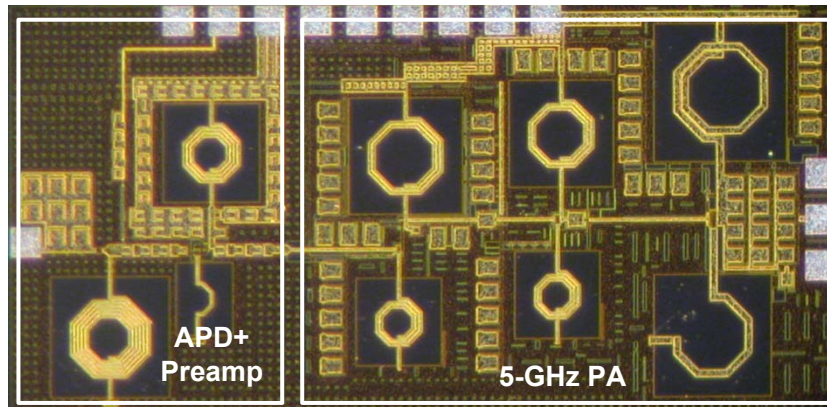
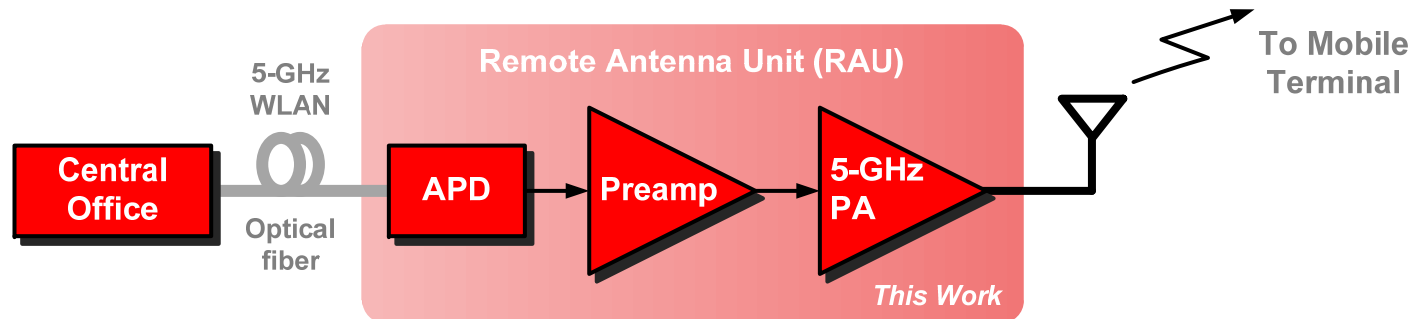


<Characteristics of integrated VCO and FD>

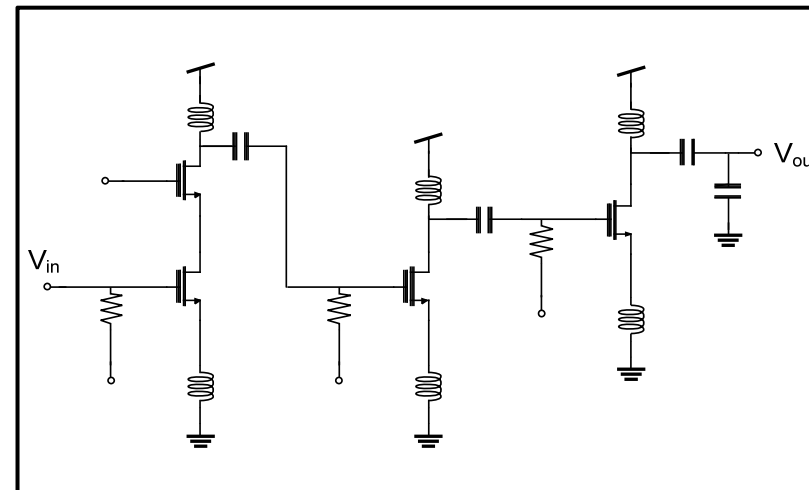
- Integrated 60-GHz VCO and regenerative frequency divider (IHP, 2011)
- Output freq. range of VCO + FD: 54 ~ 63 GHz

CMOS Optical-to-Microwave Converters

- 5 GHz applications (802.11a, Narrowband PA realization)



<Chip photo of 5-GHz Power Amp>



<3-stage 5-GHz Power Amp>

- 5-GHz PA: 3-stage (TSMC CMOS 0.18 μm)
- Frequency range: 5.15 – 5.35 GHz
- Output power > 16 dBm